Spatial Patterns and Trends of Eelgrass (*Zostera marina*) at Multiple Scales in Puget Sound: Key Findings from the First Five Years of Long-Term Monitoring

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Keywords: beach, rehabilitation, monitoring, nearshore, Bellingham, park

Eelgrass (*Zostera marina*) meadows are vital living marine resources that not only provide important ecological services but also, with gain or loss in abundance, signal a change in water quality conditions. We have monitored eelgrass in Puget Sound annually since 2000 using underwater videography, line intercept sampling, and statistical extrapolation. Our results demonstrate how eelgrass abundance varies at multiple scales over space and time. Sound wide, eelgrass abundance remained stable the first three years but declined by 4% from 2002 to 2003. With inclusion of 2004 data, we evaluate whether this decline was part of a persistent downward trend or part of an oscillating signal of variation. While we can compare rough trends within five oceanographic basins in Puget Sound, this may not be sufficient to characterize significant changes. Consequently, we increased sampling intensity within each of the five oceanographic basins on a five-year rotation beginning with the San Juan Archipelago. We compare 2004 San Juan data to a 2003 eelgrass survey by the Friends of the San Juans. At the site scale, data provide valuable information on the magnitude of change over smaller areas. We show evidence that entire eelgrass beds have disappeared in as few as three years.